BE | VII | Mech | CAD | CAM | CIM | NOV-12

26.11.12

Con. 9418–12. **(REVISED COURSE)** **KR–1017**

(4 Hours) **[Total Marks : 100**

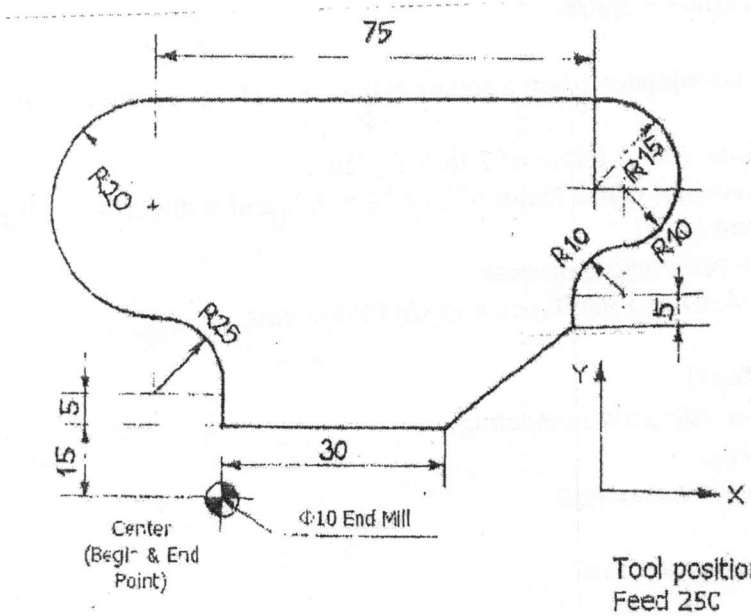
N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** question.
(3) **Figures** to the **right** indicate **full** marks.
(4) Assume **suitable** data, if **necessary** and **clearly** state the same.
(5) Precise **systematic** presentation of answer will be given due weightage while assessing.

1. (a) Explain CAD tools required to support the different design phases. **6**

(b) The coordinates of four control points relative to a current WCS are given by – **8**
$P_0 = [2\ 2\ 0]^T$, $P_1 = [2\ 3\ 0]^T$, $P_2 = [3\ 3\ 0]^T$, and $P_3 = [3\ 2\ 0]^T$. Find the equation of the resulting Bezier curve. Also find points on the curve for $u = 0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}$ and 1.

(c) Explain OPITZ classification system for part families. **6**

2. (a) Write a complete part program using G and M codes to machine the outline of the geometry as shown in **figure** – **10**
Assume – (i) Incremental positioning system.
(ii) Suitable tool and name it.
(iii) Start and end point as shown in figure.



Tool position : X0.0 Y0.0 Z3.0
Feed 250
Depth : 3

(b) Explain any one hidden line removal algorithm and explain how the algorithm determine which entities are hidden. **10**

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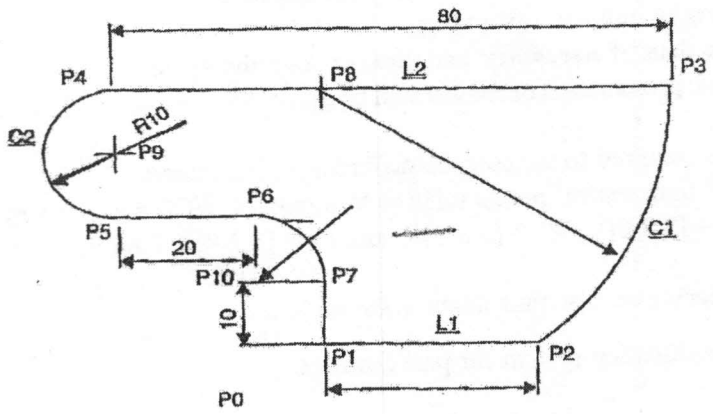
3. (a) Explain collaborative engineering. 5
   (b) Explain the CIM wheel in detail with respect to importance, functioning and features of it. 8
   (c) Explain concept of Ray tracing. Give parametric vector representation of a Ray. 7

4. (a) Write a program in object oriented language for 3D geometric transformations which include functions for the following operations :- 10
      (i) Translation (ii) Rotation @ y axis (iii) Scaling.
   (b) Write a complete APT program to machine the outline of the geometry as shown in **figure** ? (Assume suitable data). 10



5. (a) Explain machining centres and its types. State their specifications. 7
   (b) State the reasons which resulted in the development of graphic standards and describe with neat sketch, the organization of typical CAP/CAM software. Also compare critically GKS and PHIGS graphic standards. 10
   (c) Explain similarity coefficient matrix. 3

6. (a) Find the transformed coordinates when a square [(1, 1), (2, 1), (1, 2) and (2, 2)] is scaled for – 8
      (i) Uniform scaling with a factor of 2 in XY plane.
      (ii) Non uniform scaling with a factor of 2 and 1·5 in X and Y directions, while anchoring point (1, 1)
   (b) Explain any one Rapid prototyping process. 6
   (c) List benefits of using Artificial intelligence in CAPP systems. 6

7. Write short notes on (any **four**) :- 20
      (a) Data structures for interactive modeling
      (b) Green manufacturing
      (c) Retrieval types process planning
      (d) Types of AS/RS
      (e) Coordinate measuring machine.
